CRES® REPORT

CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

SPRING 1993

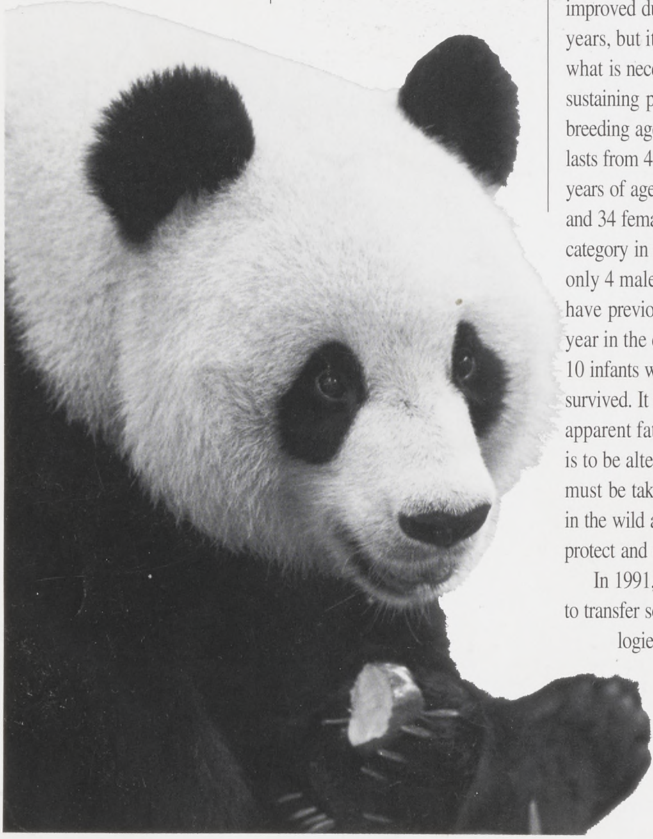
Finding Ways to Save the Giant Panda

The charming, cuddly black-and-white giant panda the world has come to cherish is, without a doubt, on the brink of extinction. Few members of this species exist in the wild, and the small captive population has not reproduced successfully enough to become self-sustaining. In the wild, giant pandas exist in small, isolated populations with a total number of fewer than 1,000. Poaching persists despite stringent regulations by the Chinese government, and habitat continues to give way to logging projects and village growth.

There are approximately 100 giant pandas in captivity and, of these, 17 live outside of China. Historically, giant pandas have been given to a nation as gifts of the state. For this reason, they often reside in capital cities, such as the National Zoo in Washington, D.C.

Reproduction in captivity has improved during the past few years, but it is still far below what is necessary for a self-sustaining population. The breeding age for the giant panda lasts from 4 to a maximum of 20 years of age. Currently, 23 males and 34 females fit this age category in captivity. Of these, only 4 males and 15 females have previously reproduced. This year in the captive population, 10 infants were born but only 7 survived. It is clear that if the apparent fate of the giant panda is to be altered, critical steps must be taken immediately--both in the wild and in captivity--to protect and enhance this species.

In 1991, we began an effort to transfer some of the technologies available in our laboratories at CRES to the scientists at the panda breeding centers within



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CRES® is operated by the Zoological Society of San Diego.

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Finding Ways to Save the Giant Panda

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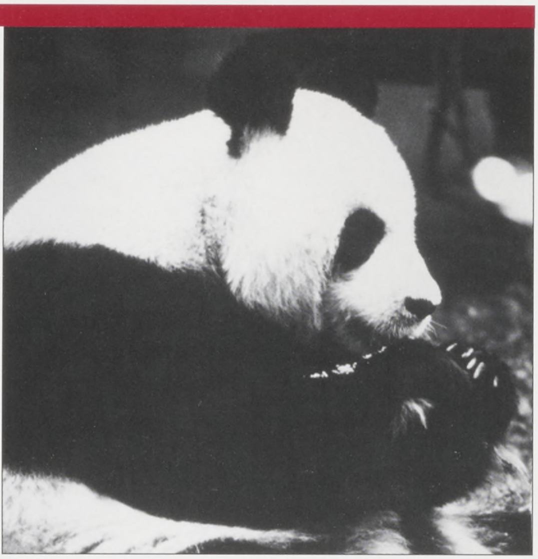


China. Since a giant panda will ovulate only once each year, sometime during the breeding season of January to June, it is important for the managers of the pandas to determine the day of ovulation. In this way, timed matings or artificial insemination can be most effective because this species is socially solitary and, in general, is not housed in pairs. We can now monitor urinary estrogen concentrations as a marker for impending ovulation. As the time for ovulation approaches, the follicles produce increasing amounts of estrogen. At the approximate time of ovulation, estrogen levels fall dramatically.

The technique of urinary estrogen detection established at the CRES laboratories for many species has also proved extremely useful in the giant panda. Two Chinese Giant Panda Breeding Centers at Fuzhou and Chengdu were the first to receive this technology. In the spring of 1992, CRES staff traveled to these two breeding centers to instruct their scientists in these methods. Initially, it is important not to use this technique for timing of ovulation but to first establish normal hormone parameters. In 1993, we will continue this training at the Wolong Breeding Center. These techniques can be used to time ovulation and assess nonreproductive females.

This year, the Chinese government has developed a plan for the protection and management of the giant panda in the wild and of its habitat, in cooperation with World Wildlife Fund International. Seventeen new reserves are planned, along with the establishment of land corridors to connect isolated panda habitats.

The San Diego Zoo will be fortunate to exhibit this rare species when two pandas arrive later this year on a long-term breeding loan. CRES scientists will be able to study the giant panda and develop techniques to improve its breeding record in captivity. In addition, because the plan for habitat preservation is so costly, the Zoological Society of San Diego will make a donation to the Giant Panda Habitat Protection Plan of China during the pandas' stay in San Diego. In this way, we will be contributing not only to the preservation of the giant panda in the wild but also to scientific study that will increase giant panda reproduction in captivity.

--Nancy Czekala-Gruber

ABOUT THE AUTHOR: NANCY CZEKALA- GRUBER, CRES ENDOCRINOLOGY SPECIALIST

After seven years with the reproductive medicine department at the University of California Medical Center, San Diego, Nancy Czekala-Gruber joined the Center for Reproduction of Endangered Species in 1976, where she is currently an endocrinology specialist. Her most recent work has focused on infertility studies of the mountain gorillas in Rwanda and the application of these results to captive lowland gorillas. In 1992, Nancy took part in a rhino reproductive study. She continues to work with scientists in China on giant panda reproduction problems and solutions. Nancy is a member of the Society for the Study of Reproduction, the Endocrine Society, the American Society of Primatology, and the International Society of Primatology. She is also a reviewer for several scientific journals, a member of the Captive Breeding Specialists Group, scientific advisor to the Gorilla Species Survival Plan, and a member of the adjunct faculty of the biology department, San Diego State University.

Behavior

Dr. Jacqueline Ogden continues to expand the role of the behavior division at CRES in conducting applied research in the area of exhibit evaluation. As part of this work, Dr. Ogden has been researching the effects of the technologically sophisticated sound system in Gorilla Tropics on the gorillas housed there. Specifically, she is interested in the effect of different noises associated with captive housing, such as cleaning and vocalizations of other primate species, and the ability of ecologically relevant rain forest sounds (such as bird songs) to mask such noises in the gorillas' indoor holding facility. The results of her study indicate that the captive-housing noises did have an effect on the behavior of the gorillas and are associated with increased displays and arousals. The rain forest sounds did effectively mask these effects for the young animals involved in the study, but they did not do so for the adults. Plans are underway to modify the sound system to allow the gorillas to turn the sounds on and off by their presence in particular areas. If conducted in the exhibit area, this might allow us to reinforce use of different areas of the exhibit.

Cytogenetics

Researchers in the cytogenetics division at CRES are working with veterinarians, curators, and other researchers to identify animals with chromosomal abnormalities or rearrangements. The reproductive success of animals in captivity can depend on the detection and documentation of chromosomal abnormalities. Such abnormalities can also identify the cause of death, which might otherwise go undetected at a postmortem examination. CRES researchers worked with geneticists at the Brookfield Zoo in Chicago to discover why an okapi calf had died soon after birth. It was diagnosed with a trisomy condition (three copies of a chromosome instead of the normal two). At the San Diego Zoo, a pair of douc langurs with a history of stillborns and abortions was evaluated chromosomally. It was found that the female is a carrier for a balanced chromosomal rearrangement, putting her at high risk for unsuccessful pregnancies. With this knowledge, animal care managers can remove her from the breeding pool. Identification of chromosomal abnormalities is, of course, based on the researchers' knowledge of the normal chromosomal complement for a species, against which any abnormalities can then be compared. Many species still remain to be evaluated, and the cytogenetics division at CRES continues to study the chromosomes of a wide range of mammalian species.

Virology/ Immunology

As the population of free-ranging black rhinoceroses declines rapidly, the need for information concerning the genetic health of the species has become urgent. Dr. Michael Worley, virologist, and Ann Carpenter, senior laboratory technician, of the virology/immunology laboratory at CRES have isolated DNA clones of the major histocompatibility complex (MHC) of two subspecies of black rhinoceros. The MHC plays a major role in the recognition of infectious agents as being foreign and in the regulation of the ensuing immune response. Many scientists believe there is a direct correlation between the extent of genetic variation in the MHC and the ability of an individual's immune system to respond beneficially against infectious organisms. Using the DNA clones they have isolated as molecular probes, Worley and Carpenter will determine the level of variation in this gene product in both captive-raised and free-ranging members of the two geographically separated black rhino subspecies.

"Can Do" for Endangered Species

Cans for Critters invites teachers and parents to join in the fight to save endangered species by attending an orientation to be held on Saturday, February 6, 1993, in the Rondavel at the San Diego Zoo. For more than a decade, San Diego County students have helped endangered species by recycling cans and donating the proceeds to the Zoological Society's Center for Reproduction of Endangered Species (CRES). Fun incentives such as Cans for Critters neon pencils, stickers, and discount coupons for the Zoo and Wild Animal Park are provided by the Zoo. Special prizes for top collectors are awarded at the Jamborees held at the Zoo and Wild Animal Park at the end of the drive. While total proceeds from this year's Cans for Critters drives are not yet tallied, the Cans kids have already contributed more than $42,000 to the 1992 Cans for Critters campaign. For more information on how your school or group can participate in the March 1st Spring Drive, please call Arlene Wyrick at the Zoo's development office, (619)231-1515, ext.4597.

CRES Grants

The comparative physiology division of CRES has received a grant for $1.1 million from the **United States Agency for International Development (USAID)**, a branch of the Department of State. The grant, to undertake a three-year biodiversity survey of Etosha National Park in north central Namibia, is the largest single grant ever received by CRES. The goal of the study is to examine the interactions of herbivore and carnivore populations within the Park, and ultimately to make recommendations regarding the translocation of animals from the Park to surrounding tribal areas. Because much of the foreign revenue coming into Namibia is related to tourists who visit Etosha, establishing a long-term management plan with regard to populations of animals that inhabit the Park is essential.

Special thanks to the **Guerin Foundation** for providing funds to renovate and convert the off-exhibit building at the Zoo for the pygmy loris collection. The new primate facility provides a safe, warm environment for these rare animals and will enable CRES researchers to conduct behavioral studies. It will also permit observation in a reverse night-and-day cycle.

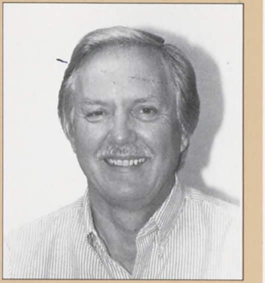
A young pygmy loris.

Dr. Barbara Durrant, head of the reproductive physiology division, has received a $5,000 grant for 1993 from the **L.J. Skaggs and Mary C. Skaggs Foundation**.These funds will be used to initiate work on a new research project involving the postmortem rescue of oocytes from endangered species. New techniques offer the potential to collect many immature oocytes from deep within the ovary, regardless of the age of the female or her reproductive status. The oocytes can be grown and matured *in vitro*, and they are then cryopreserved for future fertilization and eventual transfer to recipients for gestation.

CRES Comparative Physiologist Dr. John Phillips has been awarded a two-year, $125,000 grant from the **National Science Foundation (NSF)** to study ground iguanas in Cuba, at the Guantanamo Naval Base. The CRES field study of these critically endangered large lizards--weighing up to 20 pounds--will be the first of its kind. The study's goal will be to answer basic questions about the reproductive biology of a single species and then to design a conservation strategy that can be applied not only to ground iguanas but also to other large lizard groups.

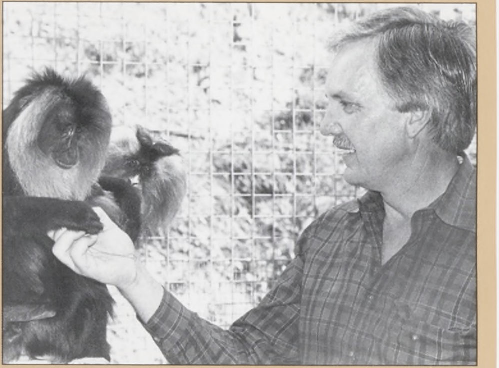
DR. DONALD LINDBURG

New Committee Appointment for CRES Scientist



CRES Research Behaviorist Dr. Donald G. Lindburg has been invited by the National Institutes of Health (NIH) to serve a four-year term as a member of the Comparative Medicine Review Committee (CMRC), National Center for Research Resources (NCRR). This committee is advisory to the director of NIH and the director of NCRR, and one of its primary responsibilities is to advise on grant applications. This committee also provides advice on operation of the nation's primate research centers, projects to improve animal resources, and training program applications. Dr. Lindburg has been selected to serve on this committee because of his research accomplishments, scientific publications, and other achievements and honors. This is a unique opportunity to contribute to the national biomedical research efforts.

Dr. Lindburg joined the staff of the Zoological Society of San Diego in 1979. He has been studying macaques for 28 years and has contributed significant research findings to the studies of reproduction and social interaction in captive lion-tailed macaque populations. In 1990, Dr. Lindburg was the recipient of the National Zoological Park/Friends of the National Zoo Centennial Award for Excellence in Zoo Research. He is also the editor for Zoo Biology *and served as chairperson of the Cheetah Research Council for the American Association of Zoological Parks and Aquariums. In addition to his work with lion-tailed macaques, Dr. Lindburg is involved with research in progress on reproductive rates and reproductive success in cheetahs.*



BE MY VALENTINE!

Flamingos are pink,
Gnus can be blue,
Here's a wild way
To say I LOVE YOU!

If roses leave you cold and candy isn't your style. . . Forget the tame gifts and give your special lovebird a gift they'll be wild about.

Adopt a Flamingo!

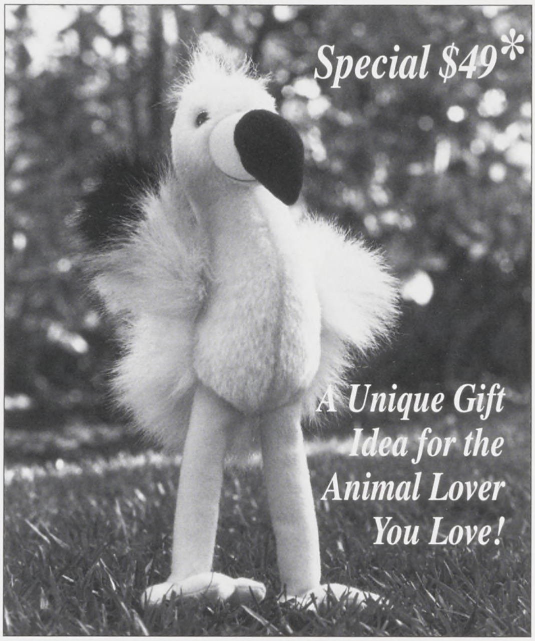
It's easy and fun to adopt! Your gift will include:

- **a cute and cuddly plush flamingo toy of their very own**
- **a handsome adoption certificate**
- **two complimentary guest passes for entrance to the San Diego Zoo or the San Diego Wild Animal Park**
- **a special card to announce your gift adoption.**

And. . . the knowledge that your contribution will help these precious birds. In prehistoric and ancient times, flamingos were found in many parts of the world, including Australia, Europe, Asia, Africa, and the Americas. Today, they are gone entirely in many areas and only small relict populations remain in others. In many areas of the world, flamingos are in trouble because of human disturbance and habitat pollution. Six varieties of flamingos are still found in the world: the greater flamingo, Caribbean flamingo, Chilean flamingo, lesser flamingo, Andean flamingo, and James's flamingo. The communal courtship and nesting behavior of a flamingo flock is often quite spectacular and complex. Once an egg is produced, both parents help incubate it. When the chick hatches, it is covered with fluffy down. The San Diego Zoo and the San Diego Wild Animal Park are currently working with four of the six flamingo species. Breeding success may help ensure that these beautiful and interesting birds will continue to fascinate future generations.

NOTE: Naturally, your adopted flamingo will remain at the Zoo or the Wild Animal Park in the care of our professional staff. Please be aware that the lives of animals for adoption are subject to unavoidable changes. For that reason, adoptions are offered by species only, not by individual animal.

*Special price good until February 5, 1993.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Or, to charge your Adoption by telephone, call (619) 557-3974 between 8:30 A.M. and 4 P.M., Monday through Friday. Orders must reach the San Diego Zoo by February 5 to ensure delivery by Valentine's Day.

☐ Please check here if you'd like more information about our Adopt-An-Animal Program.

(AHCR2)

Summer Sponsors: Invest in an Intern

Each spring undergraduate students from around the country apply for summer intern positions at CRES. These three-month positions are funded by individuals and corporations who recognize the value of placing students in research situations that will extend their experience. Past interns have demonstrated high levels of success in their academic and professional careers, such as veterinary and human medicine.

Sponsors are still needed for four intern positions, at $3,000 each. If you would like to sponsor an intern for the summer, please call Amy Parrott at the Zoo at (619) 685-3213.

Nancy Czekala-Gruber (left) meets with a group of summer interns. CRES is located in the Zoo Hospital.

Elephants, Tigers, Bears--And More!

The CRES Collection by the San Diego Zoo

Children who love learning about animals will want to start their own collection by **Battat, Inc.**, an international toy company, which has entered into a licensing agreement to produce plastic toy animals. Proceeds from the sale of this line will benefit CRES. The initial series of about 65 pieces will include such species as elephants, tigers, lions, giant pandas, crocodiles, geckos, pythons, and humpback whales. The **CRES Collection** of animal families will be available at toy stores nationwide and will include a tag with information about the CRES mission.

C·R·E·S REPORT
CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

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SAN DIEGO ZOO · SAN DIEGO WILD ANIMAL PARK

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